

Acoustic
Ephemera
and
Transmissions
of Weakness
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tell me about yourself
where were you in the eighties?
you drink prosecco, why?
I speak to you now
from an opening eye
from a spiritual buttress factory
I hope for you
to reap the burning
of light
that hits us from the sky
what's your restaurant?
who are your people?
that you wait for the most?
who is your bearer?
what are you wearing?
who let you in?
will call out
if you faint
when I come down?
who is the heaviest child
you've ever held?
talking inwards
shouldn't be so hard
to think

—Morgan Vo



Acoustic Ephemera and Transmissions of Weakness accompanies a collection of scores, grouped together as part of an ongoing series entitled *Folded Cyanotypes*. Initiated via an evolving instrumentarium of resonant zithers that are augmented by electronics, the music of this portfolio encourages heightened environmental perception, as well as experiential associations of touch, memory, and musical lineage. Through a consideration of materialist strategies toward noise, feedback, sympathetic resonance, interference patterns, and the harmonic series, the feedback matrix of *Folded Cyanotypes* and its resulting gestural language have taken shape as expressive tools for performance, and as relational models for composition and improvisation. My attention to amplifying physical disturbance and material sensitivity within this specific musical system is part of an effort to disrupt and recontextualize my earlier guitar-based music influenced by abrasive developments in noise and drone genres. In formulating this approach, I have looked to the writings of theorists Boris Groys, Christoph Cox, Marie Thompson, and Brian Kane for their insights into noise, affect, materiality, and transtemporality in sound, music, and visual art. The fragile materials of analog recording technologies—the membrane of the condenser microphone, the light-sensitive emulsion of darkroom photography,

the unstable chemistry of plastic film and magnetic tape reels—have been reimagined as metaphors for an artistic mode that values tactile sensitivity, contingency, and the affective potential of weakness.

Partly inspired by a series of works by artist Josiah Valle Ellis, the photographic process of the cyanotype (a kind of photogram commonly used for making blueprints) clarifies this compositional practice. Far from being a neutral schematic pointing toward a mechanism or site, the folded cyanotype documents its own manipulation and lays bare its material qualities. It takes on attributes of its surroundings through contact and exposure to light, but visibly limits and filters the reproduction of these encounters. Drawing parallels between the surface of the zither strings and the surfaces of recording substrates, the cyclical buildup and breakdown of signals in the *Folded Cyanotypes* series at once reflects broader physical properties of acoustic vibration, and the distinct conditions, tuning and preparation of these instruments. Consistent with Marie Thompson's analysis of the fluid and communicative properties of noise, the *Folded Cyanotypes* collection serves as a revision to the binaries of success/failure, signal/noise, sound/music that have permeated and sometimes restrained my work with conventional instruments.

Weak Noise

10 In his essay “The Weak Universalism,” written in 2010 for the art publication *e-flux journal*, Boris Groys argues that “[living] within modernity means to have no time, to experience a permanent scarcity, a lack of time due to the fact that modern projects are mostly abandoned without being realized.”¹ Groys continues that “our present time is not a postmodern but rather an ultramodern time, because it is the time in which the scarcity of time, the lack of time, becomes increasingly obvious.”² While “The Weak Universalism” was influential to the visual work I was making as an art student in the years following its publication, I have since sought ways to repurpose Groys’s language in the contexts of music and sound. Groys’s argument is decidedly art historical in scope, looking at how the development of visual abstraction by artists like Wassily Kandinsky and Kazimir Malevich engaged with the question of “[how] can one make art that would escape permanent change—art that would be atemporal, transhistorical? The avant-garde did not want to create the art of the future—it wanted to create transtemporal art, art for all time.”³ In musical contexts, an equivalent process of “radical reduction” can be found across

the work of many of the composers I have looked to in communicating the intentions of *Folded Cyanotypes*, from the explorations of the ‘swell’ form in James Tenney’s ‘Postal Pieces,’ to Éliane Radigue’s *Occam Océan* series of solos for acoustic instruments. However, most useful to my project has been Groys’s positing of the “weak gesture,” through which “the artists of the avant-garde began to create images that seemed to them to be so poor, so weak, so empty, that they would survive every possible historical catastrophe.”⁴ Where Groys determines this absence of strong symbolism to be a fraught strategy for resisting the upheaval of modernity, *Folded Cyanotypes* asks what other outcomes are available through weakness. What can weak materials reveal about the present?

Theorist and philosopher Christoph Cox, beginning in 2011 with the essay “Beyond Representation and Signification: Toward a Sonic Materialism,” and expanding his argument with the 2018 book *Sonic Flux*, presents a reappraisal of these ideas imbued with an awareness of the transformative physical processes that characterize ‘the nature of the sonic.’ In his essay, Cox echoes Groys’s observations on a state of permanent change: “sound and the sonic arts are firmly rooted in the material world and the powers,

forces, intensities, and becomings of which it is composed...On the materialist account...
12 sound is thoroughly immanent, differential, and ever in flux.”⁵ While Cox recognizes that the vibrational forces of sound are evident in musical forms, he contends that the most meaningful engagements with the sonic have focused on the “*materiality* of sound: its texture and temporal flow, its palpable effect on, and affection by the materials through and against which it is transmitted.”⁶ Elaborating on this premise in *Sonic Flux*, Cox differentiates between the realms of music and sound:

“If music belongs to the symbolic, then sound belongs to the real... Sound art is the art of the auditory real. It is concerned not with the communication of musical values but with an exploration of what [John] Cage called ‘the entire field of sound’ and the nature, movement, and transmission of sound as a material, physical substance.”⁷

While the instrumental system of *Folded Cyanotypes* takes inspiration from artists who have explored a sonic materialism, it decidedly embraces music, concerning itself with pitch, timbre, and subjective, culturally determined associations of

consonance and dissonance. Responding to Cox and others in the 2015 essay, “Sound studies without auditory culture: a critique of the ontological turn,” Brian Kane questions the validity of what he terms ‘onto-aesthetics’ within sonic materialism. Onto-aesthetics, as Kane defines it, is “the principle that a work of art can disclose its ontology.”⁸ For Kane, rather than embodying essential traits of an objective reality in flux, sonic materialism reflects the subjective ontological commitments of an intellectual community. In distinguishing between music and the sonic arts, Kane believes Cox has mistaken the ‘embodiment’ of sonic materiality for its ‘exemplification’ in sonic art that directly references material processes.⁹ Writing later in *Sonic Flux*, Cox concedes that the fluid nature of sound is equally present within both music and sound art, but maintains that “works of art can reveal these production processes, and...some artworks do this more richly and profoundly than others.”¹⁰ Pertinent to the musical fragments of *Folded Cyanotypes* for its incomplete and unfinished character, Cox believes a kind of partial ‘sampling’ from sonic flux can accomplish this, which he identifies in the work of Cage, Alvin Lucier, Maryanne Amacher, and Annea Lockwood, among many others.

14 Whether or not Kane accepts this selective sampling as a disclosure of the ontology of sound, his writing nonetheless demonstrates an investment in intrinsic qualities of noise and uncertainty in the *perception* of sound. In *Sound Unseen*, written in 2014, Kane investigates a related ontology of acousmatic sound. Here Kane focuses on the implications of the ‘acousmatic reduction’—by which a sound is separated from its nameable, physical source—that was formalized by Pierre Schaeffer in the 1940s and championed by the composers of *musique concrète*. Considering Michel Chion’s concept of ‘fundamental noise’ in cinema, Kane cites John Cage’s account of a visit to an anechoic chamber at Harvard University in 1951, where Cage claims to have observed two sounds—one low, and one high—that he was told were his circulatory and nervous systems in operation: “Imagine the uncanny shock at realizing that two sounds, which were assumed at the outset to be attributed to exterior sources, were actually subjectively produced.”¹¹ While it’s disputed whether Cage was in fact experiencing a mild form of tinnitus, for Kane the story reflects the “underdetermination” of acousmatic listening, where a subjective element of noise and irresolution is always present.¹²

Borrowing and adapting Groys’s concept

of the weak artistic gesture, I have mapped an environmental sensitivity to noise—a quavering and fragile collection of voices that must be carefully balanced—onto the avant-garde’s pursuit of transhistorical materials.¹³ Deeply personal in nature, *Folded Cyanotypes* does not forgo representation and signification, but rather offers an abstraction of genre through materialist tactics as a way to alter the affective bounds of sonically extreme musical traditions. This framework is of a piece with a recurring creative inclination to place amplified and distorted signals commonly associated with aggression and abrasion within vulnerable environs.

In her 2017 book *Beyond Unwanted Sound*, Marie Thompson similarly critiques what she calls the “poetics of transgression” that has dominated the stylistic trajectory of noise music. Thompson notes, “the poetics of transgression relies on two interconnected assumptions: that noise is the (material and discursive) antithesis of music; and that noise is definitively unwanted, bad or negative...”¹⁴ Although Thompson does not dismiss the contributions of artists who have operated under these assumptions, she raises the prospect that this binary perspective “reduces noise’s productive, affective potential (i.e. what noise does) to

its imagined capacity to shock, dominate, overwhelm or offend.”¹⁵ In lieu of a poetics of transgression, Thompson identifies an elemental noise music that “makes audible the noisy presence of the material milieu/medium that typically evades perception.”¹⁶ The foregrounding of fundamental noise is especially important to *Folded Cyanotypes*, which while informed by composers like Tenney of the avant-garde classical tradition, is equally motivated by historical developments of no wave, noise rock, industrial and drone metal in the 1970s, 80s and 90s by artists like Throbbing Gristle, Sonic Youth, Boredoms, Earth, and Sunn O))) that have served as my entry point into experimental composition. With these subcultures in mind, the meaning of ‘acoustic ephemera’ that I suggest here refers to both the subtle frequency components emerging from the resonant body of the zither, as well as to the symbolic fragments of genres related to amplification, feedback and distortion that I have sought to reframe as weak gestures.

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- 1 Boris Groys, “The Weak Universalism,” *e-flux journal* 15 (April 2010): 4, <https://www.e-flux.com/journal/15/61294/the-weak-universalism/>.
 - 2 Groys, “The Weak Universalism,” 4.
 - 3 Groys, “The Weak Universalism,” 5.
 - 4 Groys, “The Weak Universalism,” 6.
 - 5 Christoph Cox, “Beyond Representation and Signification: Toward a Sonic Materialism,” *Journal of Visual Culture* 10, no. 2 (2011): 157.
 - 6 Cox, “Beyond Representation,” 148-149.
 - 7 Christoph Cox, *Sonic Flux: Sound, Art, and Metaphysics* (Chicago: The University of Chicago Press, 2018), 102-103.
 - 8 Brian Kane, “Sound studies without auditory culture: a critique of the ontological turn,” *Sound Studies* 1, no. 1 (2015): 11, <https://doi.org/10.1080/20551940.2015.1079063>.
 - 9 Kane, “Sound studies without auditory culture,” 11.
 - 10 Cox, *Sonic Flux*, 132.
 - 11 Brian Kane, *Sound Unseen: Acousmatic Sound In Theory and Practice* (New York: Oxford University Press, 2014), 161.
 - 12 Kane, *Sound Unseen*, 161.
 - 13 Groys, “The Weak Universalism,” 5.
 - 14 Marie Thompson, *Beyond Unwanted Sound: Noise, Affect and Aesthetic Moralism* (New York: Bloomsbury Academic, 2017), 142.
 - 15 Thompson, *Beyond Unwanted Sound*, 144.
 - 16 Thompson, *Beyond Unwanted Sound*, 152.

I speak to you now from an opening eye

For three vocalists and microphone/zither matrix

A. Performer 1 begins the piece by choosing a vocal pitch above middle C, and singing into their microphone in long, sustained tones. The sung pitch should be held as long as is comfortable, and repeated with pauses for breath. Expression and dynamics of the held tone are the performer's choice.

B. After several repetitions of the initial pitch by Performer 1, Performer 2 begins to move slowly over the surface of their zither with a transducer/glass pair, receiving signal from Performer 1's microphone. In scanning the surface, Performer 2 listens for bright partials or harmonic nodes that resonate with the chosen vocal pitch.

C. Once Performer 2 has found a sympathetic string position for the excited glass, they join in singing Performer 1's vocal pitch. After a moment with their voices in unison, Performers 1 and 2 begin to stray from the initial tone, oscillating at different rates between microtones above and below the starting pitch (drifting at most by a semitone).

D. Performer 3 enacts a similar search as Performer 2 in Part B, scanning the surface of their zither with vocal signal from Performer 2 sent to a transducer/glass pair.

E. Once Performer 3 has found a sympathetic string position for the excited glass, they join the other vocalists in singing pitch oscillations.

F. Completing the loop, Performer 1 moves over the zither surface with their transducer/glass pair, listening for resonance and friction with Performer 3's vocal signal. Performer 1 continues to sing pitch oscillations throughout this process.

G. With all three glasses in position, the vocalists move gradually toward synchronizing the rate and degree of their pitch oscillations. This consensus should be formed by ear, and through eye contact between the performers.

H. Performer 3 cues the final gesture. The three participants slide their glasses down the surfaces of the zithers, gradually lowering their voices into silence, and the piece is concluded.

I SPEAK
TO YOU NOW
FROM AN
OPENING EYE



An Extended Instrument

24 Circumstance has played an outsized role in the progression of the *Folded Cyanotypes* methodology over the past two years. The first zither I improvised with was an autoharp gifted by my partner's grandmother, rescued from the accumulated clutter of her home shortly before she relocated from Queens to Egypt in the summer of 2018. I had always loved the radiant timbre of the instrument, but had never considered a place for it in my music. While the body of the harp was in decent condition, the neglected, detuned strings produced turbulent tonal interactions that reverberated long after the initial percussive strike. To begin, I experimented with alternative tunings derived by ear, doubling many of the strings to magnify the gentle beating patterns of close pitch intervals that have frequently guided my harmonic decisions. As the intuitive chordal groupings solidified, I introduced a violin bow and felt percussion mallets to soften the instrument's attack, to savor all of the contours within the envelope's long tail.

To my ears, this richness of aural detail called for amplification. And while I thoroughly appreciated the acoustic phenomena localized to the strings and

soundboard, the more I practiced with the harp, the more I sought a feeling of continuity and commentary with my electric guitar music. Repurposing the hardware of the harp's felt chord dampers, I wired a coil pickup that could slide across the registers of the instrument. With the addition of a ¼" audio jack, the instrument could now be treated as any other electronic signal through distortion, modulation and effects processing. After further experiments with transducers and glass on the strings, initially actuated by a square wave oscillator, I realized—again by chance—that I could produce harmonically rich feedback based on the placement of the excited glass on the autoharp's strings.

A number of composers who have imagined new or modified instruments as openings to compositional avenues have also articulated the importance of circumstance in shifting their musical perspective. In his 1982 graduate thesis at Wesleyan University, the same year that saw the release of his minimalist work *Nodal Excitation*, artist and composer Arnold Dreyblatt reflected on how, through his overtone experiments beginning in the mid-70s, he “proceeded from a kind of ‘amateur’ curiosity about sound and music, and developed a sense that composition begins with a consideration

26 (often a re-consideration) of the dynamic materials of sound creation – e.g. strings and pipes, air and motion.”¹⁷ Listening to the movements of *Nodal Excitation*, Dreyblatt’s purposeful scaling of these pared down musical elements is readily apparent. Dreyblatt’s Orchestra of Excited Strings, featuring simple but impactful material modifications like the addition of piano wire to the double bass, moves through gradual shifts in overtone structure with a fluid momentum.¹⁸

Sound artist and composer Ellen Fullman, a contemporary of Dreyblatt in the experimental scene of New York City in the early 80s, describes a similar unintentional encounter that shaped the trajectory of her ongoing installation, *The Long String Instrument*. Consisting of dozens of metallic strings installed across different resonant architectural spaces, Fullman’s site-specific instrument is activated by performers who walk along the precisely tuned strings, brushing steadily over them with rosin-coated fingers to draw out harmonic partials and sympathetic resonances. Fullman recounts how, in her studio, she “accidentally bumped against the wire where [her] bowing had left a deposit of rosin and discovered a very pure and loud sound.”¹⁹

Dreyblatt and Fullman share an audible fascination with harmonic nodes and acoustic overtone phenomena, yet they also demonstrate the diversity of musical propositions available through instrument building as a reduction of sound to its material components. In describing how their instruments have shaped their work, both artists identify a productive ambiguity between artist, instrumentalist, and audience, with distinct and personal compositional results. According to Fullman:

27

“What began as a raw exploration of sound...has evolved into an articulated and unique musical language, occupying a space that one enters. Listeners and performers alike feel surrounded by this sound. My music functions on multiple levels, existing as temporal compositions, as sound in space and indeed as sculpture. With my research, I hope to illuminate the physical nature of sound and the geometry of harmonic space.”²⁰

Where Fullman explicitly frames her work in the scientific, materialist language of physics and vibration, Dreyblatt offers a similar sentiment, emphasizing process and flux as they relate to musical and aesthetic concerns:

“In the development of my music, it has been the instruments themselves which have been my greatest teachers. For me, a composition is not a moment ‘frozen’ on a piece of paper but rather the result of a workshop in progress. The instrumentation and notations which have been developed for each stage in the history of my ensembles have been themselves a part of the composition...”²¹

In the variations of the zither system of *Folded Cyanotypes*, I have looked often to the example of American microtonal composer and theorist Harry Partch, an influential artist to the methods of Dreyblatt and Fullman, who by 1947 had conceived of a comprehensive theory of harmony utilizing a 43-note octave of just intervals. Like Fullman and Dreyblatt—who have followed their intuitions as listeners to arrive at detailed tuning and notation systems—Partch initiated his inquiry into microtonal scales and instruments as a “result of self-examination” before implementing a mathematical structure.²² Given the forceful aesthetic debates of his time, the rigor of his process most likely helped to fortify his music against a classical establishment that sought to delegitimize his artistic priorities. Partch addresses these criticisms from his equal-tempered peers:

“To assume that our present musical heritage will be scrapped because a few persons choose to express themselves in their own way and on their own instruments is somewhat over-flattering. It is also evidence of the unconscious but acute sense of interdependence...of all elements of the musical structure.”²³

Here I hope to highlight Partch’s nonbinary perspective toward incorporating a wider frequency spectrum into interdependent musical systems. If his contemporaries might have felt threatened by the alternative harmonic theory laid out in *Genesis of a Music*, for Partch the stakes were quite high. He writes that “when we force acoustic intervals...we effectively close all doors to any further adventures of consonance and also, amazingly, we close all doors to any meaningful adventures in dissonance.”²⁴ Instead, Partch proposed a microtonal exploration of pitch as a revitalizing force in music, something that could breathe life into older musical models of conflict and resolution. Directly inspired by the close tunings of Partch’s Harmonic Canon instruments, the amplified zithers of *Folded Cyanotypes* destabilize a sense of relative pitch through the volatile tunings, unpredictable resonances, and bright

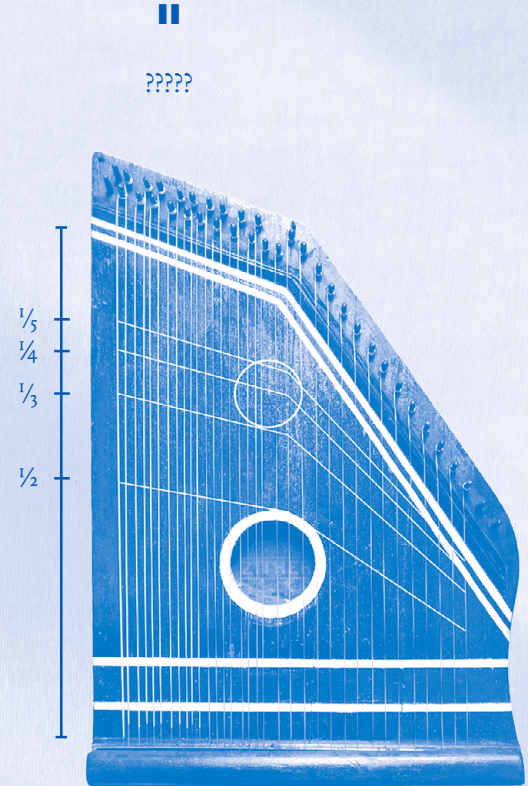
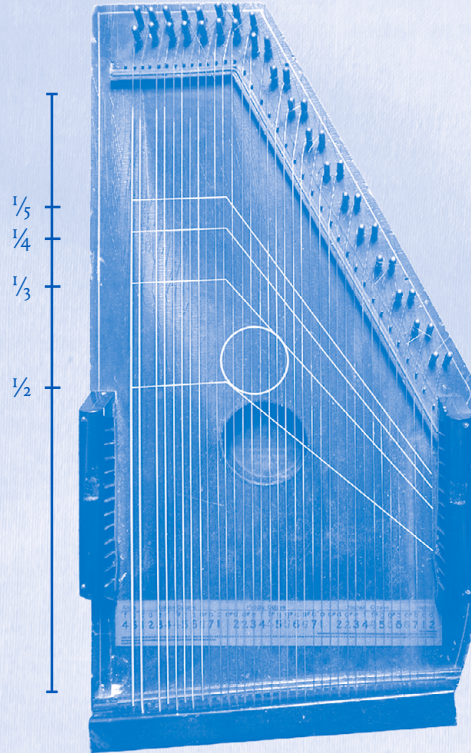
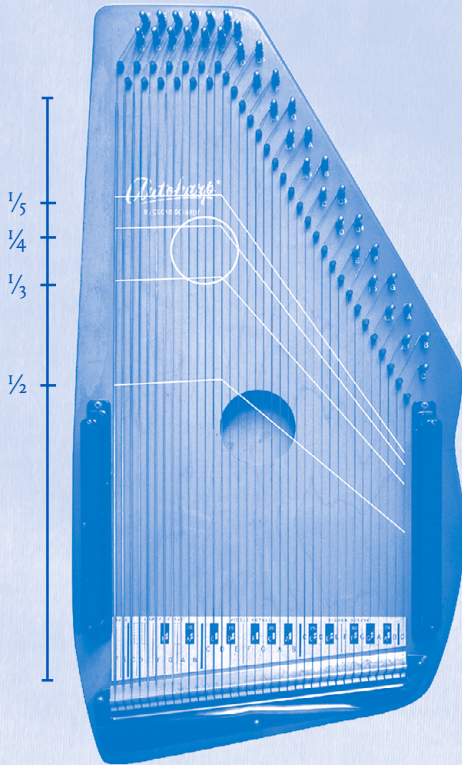
frictions of vibrating glass against strings.

30 If an expanded harmonic spectrum has the potential that Partch glimpsed early on, a timbral link between the systematized conceptions of Partch, the gradual refinements of Dreyblatt and Fullman, and the weak noise music of *Folded Cyanotypes* is the regular presence of the zither in a diversity of Eastern and Western folk and traditional musical forms. While the generic term ‘folk’ can encompass a broad swath of musical attributes, here I invoke it as a kind of collective, authorless music, developed through a latticework of community, consensus, and repetition. With the Chinese guqin, the Javanese celempung, the Appalachian dulcimer, and the Delta blues diddley bow among the numerous variants of the zither family, the multivalent subset of instruments offers an opening to reconsider the physical and cultural materials of music.

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- 17 Arnold Dreyblatt, “My Music: Beginnings, Theory and Histories,” 1982, <https://www.dreyblatt.net/articles-and-interviews>.
 - 18 Arnold Dreyblatt, *Nodal Excitation*, Drag City, no. dc629, 1982, reissued 2018, digital file.
 - 19 Ellen Fullman, “A Compositional Approach Derived from Material and Ephemeral Elements,” *Leonardo Music Journal* 22 (2012): 3.
 - 20 Fullman, “A Compositional Approach Derived from Material and Ephemeral Elements,” 10.
 - 21 Dreyblatt, “My Music: Beginnings, Theory and Histories.”
 - 22 Harry Partch, *Genesis of a Music*, (New York: Da Capo Press, 1974), 5.
 - 23 Partch, *Genesis of a Music*, 193.
 - 24 Harry Partch, “Lecture,” In *Source: Music of the Avant-garde, 1966–1973*, ed. by Larry Austin and Douglas Kahn, (Berkeley: University of California Press, 2011), 36.

nothing's different between us

E2, B, F#, C#, G#, D#, Bb, F, E3...



Approximate harmonic nodes, tunings, and initial transducer/glass pair placements for the piece.

Zither 1 has doubled strings tuned in unison, repeating in octaves above the starting pitch set of equal-tempered fifths. Zither 2 is left detuned, as it cannot be reliably fixed to specific pitches. Zither 3 is tuned in just intervals based on Kyle Gann's analysis of La Monte Young's *The Well-Tuned Piano*, repeating in octaves above the starting pitch set.* With each instrument, some drift is to be expected.

* Kyle Gann, "La Monte Young's *The Well-Tuned Piano*," *Perspectives of New Music* 31, no. 1 (Winter 1993): 134–162.

E_b2 E F F# G G# A B_b B C C# D

Ratios:

$\frac{1}{1}$	$\frac{567}{512}$	$\frac{9}{8}$	$\frac{147}{128}$	$\frac{21}{16}$	$\frac{1323}{1024}$	$\frac{189}{128}$	$\frac{3}{2}$	$\frac{49}{32}$	$\frac{7}{4}$	$\frac{441}{256}$	$\frac{63}{32}$
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Cents:

0	177	204	240	471	444	675	702	738	969	942	1173
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NOTHING'S DIFFERENT BETWEEN US

APP. 1 MIN.

VIOLIN
pp *gliss.* *mf* *p* *f* *ff* *mf* *f* *mf* *mf* *vib.*

VIOLA
pp *gliss.* *mf* *p* *f* *ff* *mf* *f* *mf* *mf* *vib.*

DOUBLE BASS
pp *gliss.* *mf* *p* *f* *ff* *mf* *f* *mf* *mf* *vib.*

ZITHER 1
 VOLUME

ZITHER 2
 VOLUME

ZITHER 3
 VOLUME

PERFORMANCE INSTRUCTIONS:

- RATE OF TREMOLO INCREASES SLOW → FAST →
- FAST TREMOLO, RATE FLUCTUATES LIGHTER BOW PRESSURE →
- SHORTER BOWING, HEAVY BOW PRESSURE, BRIGHTER PARTIALS →
- STRINGS PLAY UNPITCHED RHYTHMS DERIVED FROM FEEDBACK DENSITY ACCORDING TO MARKS
- SUSTAINED, UNPITCHED, SCRAPING TEXTURES
- PRESSURE ON STRINGS
- GLASS PRESSURE
- GLASS PRESSURE
- LIGHT CONTACT WITH GLASS

DYNAMIC MARKINGS: *pp*, *mf*, *f*, *ff*, *p*, *mp*, *mf*

TECHNICAL MARKS: *gliss.*, *vib.*, *III*³, *I*³

Spectral Presence

38 This fixation on genre and ‘folk’ timbres, collectively reiterated by different cultures, initially appears to be dissonant with sonic materialism. After all, inherent to Christoph Cox’s understanding of sonic flux is a critique of anthropocentrism:

“Yet, before there were creatures to exchange signals, there was noise: the crackling of cosmic radiation, the rush of solar wind, the roar of the sea...In this sense, noise...[is] the condition of possibility for signal and music.”²⁵

For Cox, a materialist sampling from this continuum of noise accesses the properties of a vast expanse of electromagnetic wavelengths, of which audible sound is only a select range. However, in cataloguing the expressive gestures of *Folded Cyanotypes*, the presence of music at the limits of perception, and the possibility of a mechanism to access it, offers a vital substructure over which to improvise and compose. Through this frame of reference, an acute awareness of patterns within acoustic ephemera is a way of receiving hidden, elemental music—the disclosure of a kind of fundamental noise emanating from the zither and its electronics.

Sustaining this close mode of listening, especially in performance, is an exercise in attention, but not necessarily one that precludes association and recollection. American experimental composer Pauline Oliveros, a proponent and teacher of what she called ‘deep listening,’ characterized attention as having focal and global expressions, with focal attention needing to be “renewed moment by moment, in order to exclusively follow a stream of some sort.” Global attention, by contrast, is framed as a state of sensitivity to one’s surroundings, wherein attention is “expanding to take in and listen to everything that is around you; inside of you.”²⁶ Though many compositional factors are at play in encouraging attention, pitch and timbre—the spectral components—have loomed largest in my work with the amplified zithers.

To a great extent, this goes back to my fascination with the tone of the plucked autoharp string, the timbral inspiration that prompted further electroacoustic experimentation. This detailed focus on the morphology of reduced sonic material resembles the approach taken by American composer James Tenney in his ‘Postal Pieces,’ a set of ten short compositions written between 1965 and 1971 that each fit on a single postcard. Taking a variety of structural

and poetic forms, the ‘Postal Pieces’ reflect Tenney’s perceptual preoccupation with the
40 basic compositional shape of the ‘swell,’ as well as with subtle gradations of intonation. In a 1978 interview, Tenney discussed his perspective on this reduction:

“I think of form as the same thing, on a larger temporal scale, as what’s called content on a smaller scale. That old form/content dichotomy is, to me, a spurious one, because they involve the same thing at different hierarchical levels of perception. What we take to be the substance or content of some sound—say, a string quartet—is really the result of forms—formal shapes and structures at a microscopic, or ‘microphonic’ level...”²⁷

Enacting this position—though bearing a closer resemblance to Tenney’s other basic shape, the ‘clang’—the *Folded Cyanotypes* piece “if I throw another echo,” derives dynamic and timbral shape from the waveform and spectral analysis of a single percussive strike of the zither strings. Written for open percussion with the necessary inclusion of cymbals and/or metallophones, “if I throw another echo” begins with an unknown simultaneity of frequencies, from which

the performers methodically parse and reconstruct the piece from memory using three visually distinct sections of the graphic
41 score to guide their resynthesis.

Tenney’s reflections on form, content, and the ‘microphonic’ also ring true in the music of French composer Éliane Radigue, who worked alongside *musique concrète* composers Pierre Schaeffer and Pierre Henry before arriving at a highly distinctive process of long-form tape music. Informed by her adherence to Buddhist philosophy (with which Tenney was also acquainted), Radigue’s language frequently suggests a materialist understanding of vibration and flux. In discussing the rigorous investigation of acoustic overtone structure that distinguishes her most recent *Occam Océan* solos, Radigue asserts:

“It is within this kind of vibratory universe that we live, but we have only a small zone of auditory reception by way of our ears...we humans remain limited to an extremely restricted zone compared to the infinity of the universe. This is the basis, the spirit of the work: the vertiginous nature of the inconceivable.”²⁸

Regarding attention and the weak noise within *Folded Cyanotypes*, it is noteworthy that

42 Radigue arrives at this awareness through sonic observations from outside of the traditional realm of music:

“This contemplative listening relationship to sound is something I’ve always cultivated. I remember how, when I lived near Nice airport, throughout the day I used to listen to the few planes that flew out there, trying to make out the variations in their rumbling. The ear has the ability to navigate within a sound mass and, within the continuum of this rumbling, I looked for a music.”²⁹

Radigue is of special significance to *Folded Cyanotypes* in that her music is attuned not just to the presence of environmental sound, but also to its possibilities for intimacy and interiority. As she moved from listening to her surroundings to the haunting resonant feedback works of *Opus 17*, and eventually to the tape pieces built from the oscillations of the ARP 2500 synthesizer, she felt that “[another] story was beginning. A story where breath, pulsations, beating, murmurs and above all the natural production of these marvelous, delicate and subtle harmonics could be deployed in a differently organized manner.”³⁰ In *Sonic Flux*, Cox identifies a fragility and uncertainty in the worldly,

bodily emphasis on noise in her process:

“...Radigue conceived these installations as eternal or endless, continuous and immersive fields of electrical and sonic vibration. Yet...she preferred noise to pure tones, relishing the threshold at which a feedback circuit abruptly shifts from equilibrium to nonequilibrium, exploring not the harmony of the spheres but the singular points beyond which order cascades into chaos.”³¹

43

Fittingly, in what I consider to be a nuanced departure from Cox’s nonrepresentational materialism, Radigue’s *Occam Océan* series looks to individual performers and the intimate, tactile relationships they have with their instruments. While Radigue’s earlier synthesized pieces audibly demonstrate her fascination with evolving “intermediate states,” here Radigue finds a different kind of in-between, simultaneously dissecting the frequency components of orchestral timbres, and symbolically using them to gesture toward the inconceivable.³²

The noise music of *Folded Cyanotypes* shares in this respect for hybridity and intermediacy. To take the signal flow of the zither system as one example, the

44 transducers and coil pickups of the harps can be patched to create individual and nested feedback loops, which can be interrupted by an external signal (i.e. microphone, oscillator, etc). Each sound source is likely to draw out unique resonances and frictions when auditioned through the glass against the surface of the strings. Moreover, each element has the capacity to affect the resulting feedback matrix. In this sense, the spectral components—the form, in Tenney’s analysis—can be observed to directly impact the content of the overall ensemble. The *Folded Cyanotypes* piece “I speak to you now from an opening eye” makes these relationships explicit, as three vocalists are tasked with scanning the tuned surfaces of the zithers, listening for sympathetic vibrations that reinforce the signal from one of the other performers’ microphones.

25 Cox, *Sonic Flux*, 115.

26 Pauline Oliveros, “Mission Statement,” <http://deeplistening.org/site/content/about>, quoted in Jennie Gottschalk, *Experimental Music Since 1970* (New York: Bloomsbury Publishing Inc, 2016), 107.

27 Larry Polansky, “The Early Works of James Tenney,” *Soundings* no. 13, Soundings Press (1983): 194.

28 Éliane Radigue, *Intermediary Spaces*, ed. by Julia Eckhardt (Brussels: umland editions, 2019), 158.

29 Éliane Radigue, “Time Is of No Importance,” In *Spéctres: Composing Listening*, ed. by François Bonnet and Bartolomé Sanson (Rennes: Shelter Press, 2019), 50.

30 Éliane Radigue, “The Mysterious Power of the Infinitesimal,” *Leonardo Music Journal* 19 (2009): 48.

31 Cox, *Sonic Flux*, 127.

32 Radigue, “Time Is of No Importance,” 51.

if I throw another echo

For open percussion ensemble

The shape of the work is derived from the spectral envelope of a zither, and is therefore best realized with an assortment of metallic timbres that have long and complex decays.

The piece begins with an unknown simultaneity. Conducted by a member of the ensemble, the percussionists strike once together, making contact with as many surfaces as possible in one motion.

After the initial simultaneity has completely decayed, the instrumentalists break apart the envelope's morphological traits from memory across three sections, each approximately three minutes in length.

The sections are structured according to the forms of the drawing provided. The first musician to arrive at each consecutive passage cues the rest of the ensemble to accelerate through the piece and join them.

I

The first section traces the spectral silhouette, translating the vertical to horizontal with sustained, textural playing. Dynamics are linked to the unbroken line contour of the drawing's first third.

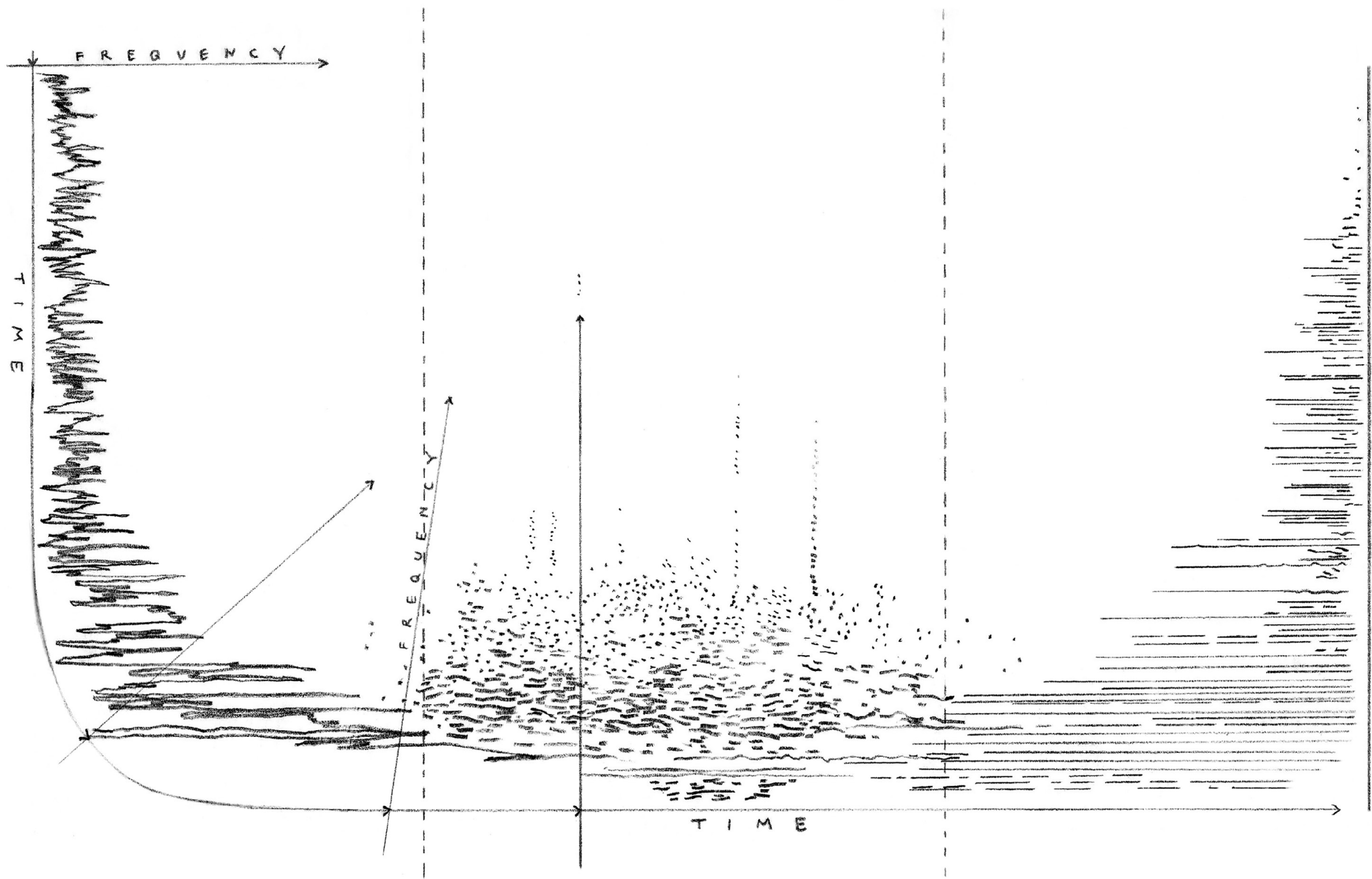
II

The second section isolates discrete timbral grains that accumulate in relation to the cloud of marks in the middle third of the drawing. In this passage, the variations in overall density take priority over the dynamic expression of each individual grain.

III

The third and final section isolates specific frequency ranges of the simultaneity, and gradually layers them according to the stacked lines of the drawing's last third. Once the frequency components of the initial envelope are reconstructed in reverse, the piece concludes at the signal of the last performer to arrive at this section.

IF I THROW
ANOTHER
ECHO



Duration and Temporal Scale

52 The interdependence of voices within the zither system also holds implications for other musical parameters, the foremost being duration. French composer Gérard Grisey, a pioneer of ‘spectral music’ in the 1970s that was derived from acoustic research, notes the counterintuitive significance of time to spectralism:

“What is radically different in spectral music is the attitude of the composer faced with the cluster of forces that make up sounds and faced with the time needed for their emergence. From its beginnings, this music has been characterized by the hypnotic power of slowness and by a virtual obsession with continuity, thresholds, transience and dynamic forms.”³³

With the sharp transients and gradual, building feedback of the zither system—the ‘clang’ and the ‘swell’—one of the primary compositional issues of *Folded Cyanotypes* has been to shape temporal density through contingent, noisy models.

In doing so, I have turned to two approaches: 1) Tenney’s “avoidance of drama” through predictable structure, and 2) American composer Morton Feldman’s

use of an architectural counterpoint between sound and silence.³⁴ Reflecting on the potential of predictable listening narratives, 53 Tenney asserts that the audience can “begin to really listen to the sounds, get inside of them, notice the details, and consider or meditate on the overall shape of the piece, simple as it may be.”³⁵ For Tenney, this receptivity allows for a recognition of ‘change’ without ‘drama.’ This view of change has proved helpful in sustaining liminal dynamic and intervallic states. The *Folded Cyanotypes* piece “nothing’s different between us,” composed for three feedback harps and a string trio of violin, viola, and double bass, consists of slowly bowed glissandi that repeatedly swell from silence, as the string players gradually drift into perfect fifth intervals. Across roughly nine minutes, the bowed timbres of the string trio are interwoven with those of the zithers, eventually leading to a swell form of unpitched textures before resolving with consonant intervals of bowed harmonics.

As for Feldman’s juxtaposition of sound and silence, Swiss composer Jürg Frey of the Wandelweiser collective, a musical descendant of Feldman and of interest for the timbral restraint of his string quartets, elaborates on the physical nature of this counterpoint:

“...the music is not about falling into silence. The sounds are clear, direct and precise. Because they have left musical rhetoric behind, there is instead a sensitivity for the presence of sound and for the physicality of silence...The two together form the ‘time present’ of the piece.”³⁶

While I would dispute whether Frey has left musical rhetoric behind, his description of a ‘time present’ is a constructive addition to Oliveros’s focal and global attention. Here the ‘time present’—and the realization of fundamental noise that Frey characterizes as ‘sensitivity’ and ‘physicality’—is inextricably linked to memory. The contrapuntal space between musical events produces something akin to an aural afterimage, albeit not one based in sensory phenomena, but rather a subjective attention to the present.

33 Gérard Grisey, “Did You Say Spectral?” *Contemporary Music Review* 19 (2000): 1-2.

34 Morton Feldman, *Give My Regards to Eighth Street: Collected Writings of Morton Feldman*, ed. by B.H. Friedman (Cambridge: Exact Change, 2000), 181. 55

35 Polansky, “The Early Works of James Tenney,” 194.

36 Jürg Frey, “The Architecture of Silence,” 1998, https://www.wandelweiser.de/_juerg-frey/texts-e.html#LIFE.

Conclusion

56 In response—and in addition—to Boris Groys’s notion of weakness as a removal of symbolism and historical specificity, I have taken to considering a more literal kind of weakness in my music, one that coalesces around the fragile timbres and unstable, noisy harmony of the zither system. The faltering oscillations of the glass on the strings—as if the instrument itself has been seized by nervous tremors—suggest a host of different registers for performance and musicianship, the most rewarding of which have magnified interference, interdependence, and contingency.

After identifying and analyzing the poetics of transgression in *Beyond Unwanted Sound*, Marie Thompson recognizes the nonbinary noise of Japanese *onkyô*, a quiet, improvised music emerging in the early 2000s from artists like Toshimaru Nakamura and Otomo Yoshihide:

“Improvisers and their instruments are not viewed as the only creative force in an *onkyô* performance. Rather, *onkyô* involves a holistic approach to the performance space, where the everyday and banal noises of the environment are afforded an affective agency in generating and shaping improvisations.”³⁷

The *Folded Cyanotypes* series likewise searches for alternative morphologies of feedback, distortion, and noise, as negotiated 57 between the personal and material intricacies of the ensemble. By compounding a focus on sonic interactions with an appreciation for permeability and attentive weakness, a different noise music can possibly emerge. To return to the metaphor of sensitive, or ‘tuned’ recording substrates, Thompson notes of the differing reactions of clay and wax to exposure to sunlight: “[How] a body is affected by its relational encounters with other bodies [shapes] and is shaped by...the body’s continuous variation in its power to affect and be affected.”³⁸ In this sense, each work of *Folded Cyanotypes* enacts a subjective, imperfect method of ambient recording as a means of shifting the listener’s capacity for weakness. Jürg Frey, reflecting on space and structure in his 1996 essay, “Life Is Present,” speaks simply to this affective potential of music and sound:

“In place of the memory of individual events we sense rather a direct manifestation of life, a richer experience of life. It is not simply an idea... It is the reality that one is alive that makes us joyful in this moment.”³⁹

58 Orienting the listener toward traces and weak, ephemeral transmissions can amplify the subtleties of experience, rather than reduce an environment to classes of wanted and unwanted. With this aim in mind, *Folded Cyanotypes* cultivates finer musical and perceptual gradations among its participants, heightening the viscosity of our present reality and drawing out the intrinsic noise of the musical medium.

37 Thompson, *Beyond Unwanted Sound*, 147.

38 Thompson, *Beyond Unwanted Sound*, 47.

39 Jürg Frey, "Life Is Present," 1996,
https://www.wandelweiser.de/_juerg-frey/texts-e.html#LIFE.

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- 61

pain completes the mountain
pine needles change Bolinas
if I throw
another echo
three seconds ago
I would've said
life's not a sure
thing at all
but here I come
followed closely
by a child
he's rich and has
few worries
we walk
nothing's different between us
not a hair out
of place

—Morgan Vo



Cody Boyce is an artist, composer, and musician based in New Haven, CT. He received a BFA in visual art from Cooper Union in 2012, and an MFA in Sonic Arts from Brooklyn College in 2020. He studied composition with Morton Subotnick and Marina Rosenfeld, and is currently developing electroacoustic music for guitar and amplified zithers. He has composed for dance, film, and installation, including collaborations with his sister, choreographer Esmé Boyce, filmmakers Joseph Barglowski and Robert Orlowski, and light artist Matthew Schreiber.

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